

TABLE 2.—Precipitation departures, monthly and annual, 1933

District	January	February	March	April	May	June	July	August	September	October	November	December	Sum
New England.....	-1.3	+0.4	+1.5	+2.4	-0.8	-0.6	-1.6	+0.7	+2.7	+0.8	-1.6	+0.3	+2.9
Middle Atlantic.....	-0.9	-0.5	+0.4	+1.1	+1.1	-0.9	-0.2	+4.4	+0.4	-1.4	-1.5	-0.8	+1.2
South Atlantic.....	-1.1	+0.6	-1.5	+0.3	-0.2	-2.3	+0.1	+0.1	+1.8	-0.1	-1.3	-2.5	-6.1
Florida Peninsula.....	-2.0	+0.4	+0.2	+1.7	-1.8	+2.1	+2.2	+1.8	-1.2	+7.8	-1.6	-1.4	+8.2
East Gulf.....	-1.3	+1.6	+0.7	+2.3	-1.6	-1.3	+1.8	-2.2	-2.0	-0.9	-1.9	-2.3	-7.1
West Gulf.....	-0.1	+0.3	+0.4	-1.4	0	-2.6	+4.0	+0.3	+0.8	-1.0	-1.4	-0.5	-1.2
Ohio Valley and Tennessee.....	-0.8	0	+1.7	+0.3	+3.3	-2.0	+0.2	+0.7	+0.9	-1.3	-1.8	+0.3	+1.5
Lower Lakes.....	-1.3	-0.7	+0.6	+0.3	+0.5	-2.0	-1.6	+0.1	-0.1	-1.2	-0.4	-0.5	-6.3
Upper Lakes.....	-0.4	0	+0.1	+0.8	+0.8	-0.8	-0.4	-1.7	+0.1	+0.6	-0.5	-0.1	-1.5
North Dakota.....	+0.3	-0.2	-0.4	-0.3	+0.2	-1.9	-0.5	-1.6	-0.8	-0.5	+0.1	+0.7	-4.9
Upper Mississippi Valley.....	+0.2	-0.7	+1.3	-0.4	+2.8	-2.1	-0.4	-1.2	+0.4	-0.5	-1.5	-0.4	-2.5
Missouri Valley.....	-0.2	-0.8	+1.0	-0.6	-0.4	-2.1	-0.7	+0.3	+0.3	-1.3	-0.9	+0.3	-5.1
Northern Slope.....	-0.2	-0.2	-0.2	+1.0	+0.4	-1.3	-0.9	+1.2	-0.2	-0.4	-0.2	+0.1	-0.9
Middle Slope.....	-0.5	-0.4	+0.2	+0.6	-0.7	-2.0	-0.7	+1.6	-0.2	-0.8	-0.3	+0.3	-2.9
Southern Slope.....	-0.4	0	-0.5	-1.4	0	-2.0	-1.8	+0.3	-1.4	-1.2	+0.1	-0.4	-8.7
Southern Plateau.....	+0.5	-0.5	-0.5	+0.2	-0.2	+0.6	-0.4	-0.5	0	0	-0.2	-0.5	-1.5
Middle Plateau.....	+0.4	-0.6	-0.5	-0.6	+0.2	-0.5	+0.3	-0.1	-0.3	0	-0.4	-0.2	-2.3
Northern Plateau.....	-0.3	-0.4	-0.3	-0.4	0	-0.5	-0.3	-0.1	0	0	-0.8	+0.7	-2.4
North Pacific.....	+1.3	-1.9	+1.7	-1.9	+0.8	-0.2	0	-0.1	+1.4	+0.4	-3.0	+5.7	+4.2
Middle Pacific.....	+0.1	-0.7	-0.3	-1.6	+0.4	-0.2	0	0	-0.4	0	-3.0	+1.8	-5.9
South Pacific.....	+2.7	-2.0	-1.5	-0.2	0	+0.1	0	0	-0.2	-0.2	-0.9	+1.7	-0.5
United States.....	-0.3	-0.4	+0.2	+0.1	+0.2	-1.1	0	+0.2	+0.1	-0.1	-1.1	+0.1	-2.1

## TROPICAL STORMS OF 1933

By G. E. DUNN

[Weather Bureau, Washington, February 1934]

Twenty-one tropical disturbances were reported this year in the Caribbean Sea, the Gulf of Mexico, and the southern portion of the Atlantic. This is the largest number observed in any one season in 46 years of record. Hitherto 16, in 1887, had been the greatest number; since that time only 9 years have reported 10 or more.

The Mexican coastal area suffered the most from these storms, for no less than 5 intense hurricanes and 2 lesser tropical disturbances crossed its coastline. Immense damage was done in and about Tampico from the two hurricanes that passed almost directly over that city. Two fully developed hurricanes and two minor storms crossed the Yucatan peninsula, but no large cities were in their paths and reports of damage are meager. The middle Atlantic coast was buffeted once in August and again in September. The earlier storm crossed the coastline at Cape Hatteras and later passed directly over Washington with diminished intensity. This was one of the most destructive storms in the history of the middle Atlantic coast. As the September storm was recurving to the northeast, the center barely touched the North Carolina coast causing great damage in the New Bern

section. Two hurricanes crossed the coastline near the mouth of the Rio Grande; the September storm caused enormous damage. The June hurricane which touched the north coast of Venezuela was the earliest known in that region and the only one to pass south of the island of Trinidad in 50 years of record.

Complete accounts of the majority of these storms may be found in the monthly issues of the REVIEW during the past year (1933).

*Monthly frequency of West Indian hurricanes and other tropical storms of the North Atlantic Ocean in 1933*

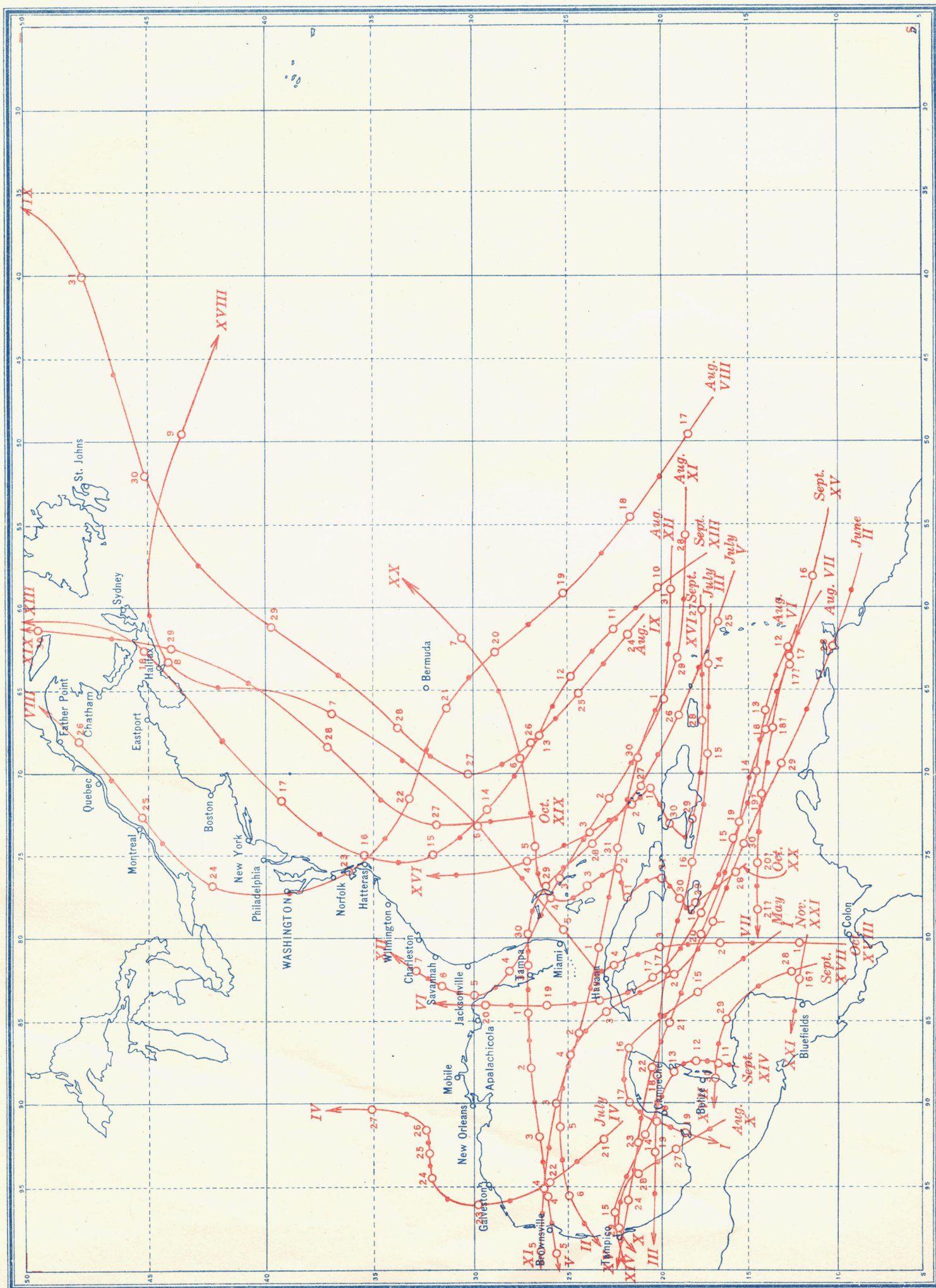
	Hurricane intensity	Doubtful	Not of hurricane intensity	Total
May.....	0	1	0	1
June.....	1	0	0	1
July.....	1	0	2	3
August.....	3	1	3	7
September.....	3	0	2	5
October.....	2	1	0	3
November.....	0	1	0	1
Total.....	10	4	7	21

*Synopsis of tropical storms of 1933. (Number of storm in table corresponds with number of track on accompanying chart)*

Storm	Date	Place where first reported	Coast lines crossed	Maximum wind velocity reported	Lowest barometer reported	Place of dissipation	Intensity	Remarks
1	1933 May 13-18.....	Western Caribbean. <sup>1</sup>	None.....	Mi. per hr. Steamship <i>Sinaloa</i> , 50.	Inches Steamship <i>Sinaloa</i> , 29.58.	Southwestern Gulf of Mexico.	Probably not of hurricane intensity.	
2	June 27, July 6....	Short distance north of Guiana. <sup>1</sup>	De Paria Peninsula, Venezuela; Mexican coast midway between Brownsville, Tex., and Tampico, Mexico.	Hurricane winds over most of path.	Steamship <i>Texas City</i> , 29.42.	Interior of Mexico....	Hurricane.....	Earliest known in Trinidad area and the only one in a record of 50 years to pass south of that island.
3	July 13-19.....	Near St. Kitts....	Yucatan Peninsula and Mexico somewhat north of Vera Cruz.	-----	-----	-----do-----	Minor disturbance.	
4	July 21-27.....	Western Gulf of Mexico. <sup>1</sup>	Texas between Galveston and Corpus Christi.	-----	-----	Near Memphis.....	-----do-----	Torrential rains over portions of Texas and Louisiana.
5	July 25, Aug. 5....	Short distance south of Antigua. <sup>2</sup>	Florida, short distance south of Fort Pierce; later Texas and Mexico slightly south of Brownsville.	85 NE, Turks Island, 72 NW, Brownsville, Tex.	About 29.00 Brownsville, 29.02 Saba Island.	Interior of Mexico....	Hurricane.....	

<sup>1</sup> Approximate place of origin.<sup>2</sup> Well developed when first appeared in field of observation.

# **Paths of Hurricanes and Other Tropical Storms, 1933** (Approximate position at each observation hour) (Plotted by Arthur J. Haidle)



Synopsis of tropical storms of 1933. (Number of storm in table corresponds with number of track on accompanying chart)—Continued.

Storm	Date	Place where first reported	Coast lines crossed	Maximum wind velocity reported	Lowest barometer reported	Place of dissipation	Intensity	Remarks
	1933			Mt. per hr.	Inches			
6	Aug. 12, 20.....	Near Barbados...	None.....			Northeastern Gulf of Mexico.	Very minor disturbance.	Heavy floods in eastern Jamaica.
7	Aug. 16-21.....	Windward Islands.	.....do.....			Western Caribbean.	Very weak disturbance.	
8	Aug. 17-26.....	Quite some distance east of Windward Islands. <sup>1</sup>	Cape Hatteras, N.C., and turned northward through Middle and North Atlantic States.	Cape Henry, 66 NE, Hurricane winds over ocean area.	Steamship <i>Antiochia</i> 27.76, Cape Hatteras 28.67.	Near mouth of St. Lawrence.	Hurricane.....	One of worst storms in history of Middle Atlantic coast.
9	Aug. 23, Sept. 24.	Several hundred miles northeast of St. Thomas.	None.....			Greenland.....	Doubtful but probably not of hurricane intensity.	
10	Aug. 27-29.....	Southwestern Gulf of Mexico. <sup>1</sup>	Mexico near Tampico.....			Interior of Mexico.....	Minor disturbance.	
11	Aug. 28, Sept. 5..	Short distance northeast of Windward Islands.	Texas and Mexico almost directly over Brownsville, Tex.	90 NW* Brownsville	28.02 Brownsville..	.....do.....	Hurricane.....	Great damage, Rio Grande Valley.
12	Aug. 31, Sept. 7..	Northeast of Antigua.	Florida near Jupiter Inlet.	125* Jupiter.....	27.98 Jupiter.....	Georgia.....	.....do.....	
13	Sept. 10-21.....	East of Leeward Islands. <sup>1</sup>	Barely touched North Carolina coast line at Cape Hatteras.	125* New Bern, N.C. 76* Hatteras.	27.96 steamship <i>Washington</i> 28.25 Hatteras.	Off east coast of Greenland.	.....do.....	
14	Sept. 10-15.....	Extreme western Caribbean. <sup>1</sup>	Yucatan Peninsula north of Payo Obispo and over Tampico, Mexico.	Hurricane winds....	28.34 Tampico.....	Interior of Mexico...	.....do.....	
15	Sept. 16-24.....	Western Caribbean. <sup>1</sup>	Yucatan Peninsula south of Cozumel and later a short distance south of Tampico.	.....do.....	Steamship <i>Virginia</i> , 27.44.	.....do.....	.....do.....	Great damage around Tampico.
16	Sept. 27, Oct. 4....	Near St. Martin..	None.....			Northeast of Bahamas.	Minor disturbance.	
17	Sept. 28-30.....	Northwest of Isthmus of Panama <sup>1</sup>	British Honduras south of Belize.			British Honduras...	Very weak disturbance.	
18	Oct. 1-9.....	Western Caribbean. <sup>1</sup>	Western Cuba.....	Steamship <i>Kaia Kindsen</i> in Bahamas 150.*	Steamship <i>Kaia Kindsen</i> , 28.31.	Merged with another storm off British Isles.	Hurricane.....	
19	Oct. 26-30.....	Some distance northeast of Bahamas.	None.....	Hurricane winds....	Steamship <i>Phoenix</i> 28.26.	Labrador.....	.....do.....	
20	Oct. 28, Nov. 7....	South of Jamaica <sup>1</sup> .	Western Jamaica, eastern Cuba.	Steamship <i>E. W. Sinclair</i> , 50 NE.	Santiago, 29.58....	Southeast of Bermuda.	Probably not of hurricane intensity.	
21	Oct. 16.....	Southwest Caribbean. <sup>1</sup>	Nicaragua near Bluefields.	Bluefields 36 SW.	Bluefields, 29.40...	Interior of Nicaragua	Doubtful.....	

\* Estimated.

<sup>1</sup> Approximate place of origin.

<sup>2</sup> Well developed when first appeared in field observation.

<sup>3</sup> Probably originated near the Cape Verde Islands on Aug. 13.

## BIBLIOGRAPHY

C. FITZHUGH TALMAN, in Charge of Library

### RECENT ADDITIONS

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